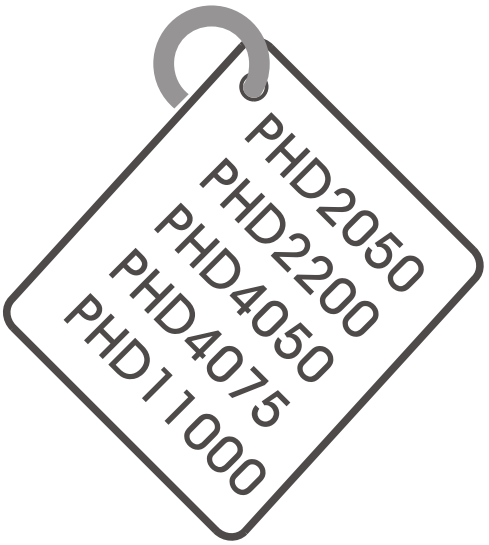
Owner's Manual
&
Installation Guide



PHD®

Audiophile Sound Systems

SPECIFICATION

AMPLIFIER	PHD2050	PHD2200	PHD4050
4 Ohm RMS Output	60W x 2	210W x 2	60W x 4
2 Ohm RMS Output	90W x 2	300W x 2	90W x 4
4 Ohm Bridge Output	180W x 1	600W x 1	180W x 2
Low Pass Filter (Variable)	50Hz-250Hz	50Hz-250Hz	50Hz-250Hz
High Pass Filter (Variable)	80Hz-1.2kHz	80Hz-1.2kHz	80Hz-1.2kHz
Subsonic Filter	20Hz-50Hz	20Hz-50Hz	N/A
Frequency Response (-1dB)	10Hz-30kHz	10Hz-30kHz	10Hz-30kHz
Signal To Noise Ratio ('A' WTD)	>100dB	>100dB	>100dB
Input Sensitivity	200mV-6V	200mV-6V	200mV-6V
Input Impedance	22k Ohm	22k Ohm	22k Ohm
Operation Voltage (negative Ground)	DC 12V	DC 12V	DC 12V
Speaker Impedance @ Stereo Driven	4 Ohm	4 Ohm	4 Ohm
Fuse Rating	25 A x 1	30 A x 3	40 A x 1
Dimensions (250 X 54 X D)mm	200	420	280

NOTE : Specifications & design subject to change without notice for improvements.

PHD®
Audiophile Sound Systems

SPECIFICATION

AMPLIFIER	PHD4075	PHD11000
4 Ohm RMS Output	80W x 4	350W x 1
2 Ohm RMS Output	110W x 4	670W x 1
1 Ohm RMS Output	N/A	1100W x 1
4 Ohm Bridge Output	220W x 2	N/A
Low Pass Filter (Variable)	50Hz-250Hz	50Hz-250Hz
High Pass Filter (Variable)	80Hz-1.2kHz	N/A
Subsonic Filter	N/A	15Hz-50Hz
Phase	N/A	0°- 180°
Frequency Response (-1dB)	10Hz-30kHz	15Hz-200Hz
Signal To Noise Ratio ('A' WTD)	>100dB	>100dB
Input Sensitivity	200mV-6V	200mV-6V
Input Impedance	22k Ohm	22k Ohm
Operation Voltage (negative Ground)	DC 12V	DC 12V
Speaker Impedance @ Stereo Driven	4 Ohm	4 Ohm
Fuse Rating	30 A x 2	30 A x 3
Dimensions (250 X 54 X D)mm	380	350

NOTE : Specifications & design subject to change without notice for improvements.

PHD®
Audiophile Sound Systems

Congratulations on your Purchase

Your new high fidelity bridgeable/stereo amplifier is designed to deliver maximum enjoy -ment and one year of trouble free service. Please take a few moments to read this manual thoroughly. It will explain the features and operation of your unit and help insure trouble free installation.

Features

PHD2050/2200/4050/4075

- Four Class "AB" High-Current Dual Discrete Drive Stages.
- Class "AB" Technology MOSFET PWM Power Supply.
- Bridgeable & TRI-Mode Operation.
- Continuously Variable 12dB/Octave High Pass & 12dB /Octave Low Pass Crossover.
- Subwoofer Variable Crossover for Deep Bass Control.
- Enhanced Bass Boost +12dB @ 50Hz.
- Silver Plated RCA, Power & Speaker Terminal.
- Soft Start & Muting.
- DC, Thermal and Short Circuit Protection.
- Power & Protection indicator.

PHD11000

- Class "D" Technology
- 1 Ohm Stable
- Spec Audiophile Grade Components
- High Efficiency PWM Power Supply
  - Multi-stranded power toroid
  - Tow toroidal core
  - MOSFET transistors
- Oversized Capacitor Banks
- Discrete Mount Power and speaker terminals
- Variable Low Pass Electronic Crossover 50Hz - 250Hz
- Built in power bridging module
- Circuit / Thermal / Overload Protection
- Bridge Sync Capable
- Remote Level Control

Precautions: Read First!

If after reading the directions you feel uncomfortable about installing the amplifier in your car, or not equipped or competent to do so, you should have the amplifier installed by an authorized installer. It's your car!

Negative battery terminal must be disconnected before any electrical connections are made.

Be sure choose a location that provides substantial ventilation for the amplifier. The most preferred locations would be in your car's trunk, under the front seats or on the back wall of a truck.

The location chosen should provide at least 2" of clearance above the amplifier for adequate ventilation.

If the amplifier is to be mounted vertically be sure that it is in a place where adequate air Will flow along the length of its heatsink fins for cooling.

NEVER mount the amplifier up side down, this will cause the heat to rise back into the amplifier causing thermal shutdown or possible permanent damage.

NEVER mount the amplifier in a location that is subject to direct sunlight or exposed to Moisture.

Be sure to mount the amplifier to a strong, solid surface which will not give way under the stress of a sudden stop or accident.

Make sure that the mounting screws will not penetrate the gas tank, brake and fuel lines, wiring or other critical parts of your car when installed.

NEVER operate the amplifier without the proper power and ground wire, 10 gauge minimum.

NEVER operate the amplifier without proper fusing. Fuse holder must be located with in 0.5 meters from the battery. This fuse is to protect the car not the electronics. In case of a short, the fuse will blow instead of the wire burning up. Using other than the recommended fuse ratings at the battery and at the amplifier may cause damage to the amplifier and will void your warranty.

Do not run wiring underneath or outside the car since exposure to the elements may cause the insulation to deteriorate rapidly, resulting in short-circuits and/or intermittent operation. all cables should be run beneath carpets and inside trim pieces.

To help minimize interference, it is best to run the power cables along the opposite side from the audio cables

Whenever wires pass through metal, rubber or plastic grommets must be used to prevent the metal from wearing through the installation and causing a short.

Whenever possible, use cable ties, mounting clamps and similar wiring aids. (available from an electrical supply or auto parts store) Adding stress relief loops to wiring is also advisable to prevent straining or breakage.

It is best to test the system before the amplifier is mounted and interior of car is reassembled.

If the temperature inside your car reaches extreme levels(such as sitting locked up for several hours in the hot sun or exposed to a very cold winter's day)the amplifier may go into protection mode and shut off. Leave the unit off until the ambient temperature returns to normal.

The amplifier operates with any vehicle using a 12 volt negative ground system. If you are not sure of the type of electrical system in your vehicle, consult your authorized dealer or qualified mechanic.

NEVER ground the speaker leads and NEVER allow the speaker leads to come in contact With each other. Speaker wire should be 18 gauge or larger.

Remote turn on wire must be switched by the radio does not have a remote turn on or antenna output, connect to wire that has a positive 12 volts when the key is turned to the accessory. If the amplifier does not turn off the battery will die.

Do not listen to high volumes for extended periods of time or hearing damage may occur.

CONTINUOUS EXPOSURE TO SOUND PRESSURE LEVELS OVER 100dB MAY CAUSE PERMANENT HEARING LOSS. HIGH POWERED AUTOSOUND SYSTEM MAY PRODUCE SOUND PRESSURE LEVELS WELL OVER 130dB. USE COMMON SENSE AND PRACTICE SAFE SOUND.

INSTALLATION

MOUNTING:

1. After reading precaution, decide where you are going to install the unit. Also, see Fig.1.

2. Once the location has been determined, place the amplifier into position. Using a felt tip pen or pencil mark the four holes to be drilled for mounting. NEVER use the amplifier as a template for drilling. It is very easy to damage the amplifier surface in this manner.

3. Remove amplifier. Drill four 3.5 m/m holes into mounting surface. If you want to mount the amplifier to MDF or wood panel, drill four 3.0m/m diameter holes into mounting surface.

4. If possible, test the system to ensure it is operating correctly before final mounting of the amplifier.

5. Mount the amplifier using the supplied 4 self tapping screws.

INSTALLATION DIAGRAM

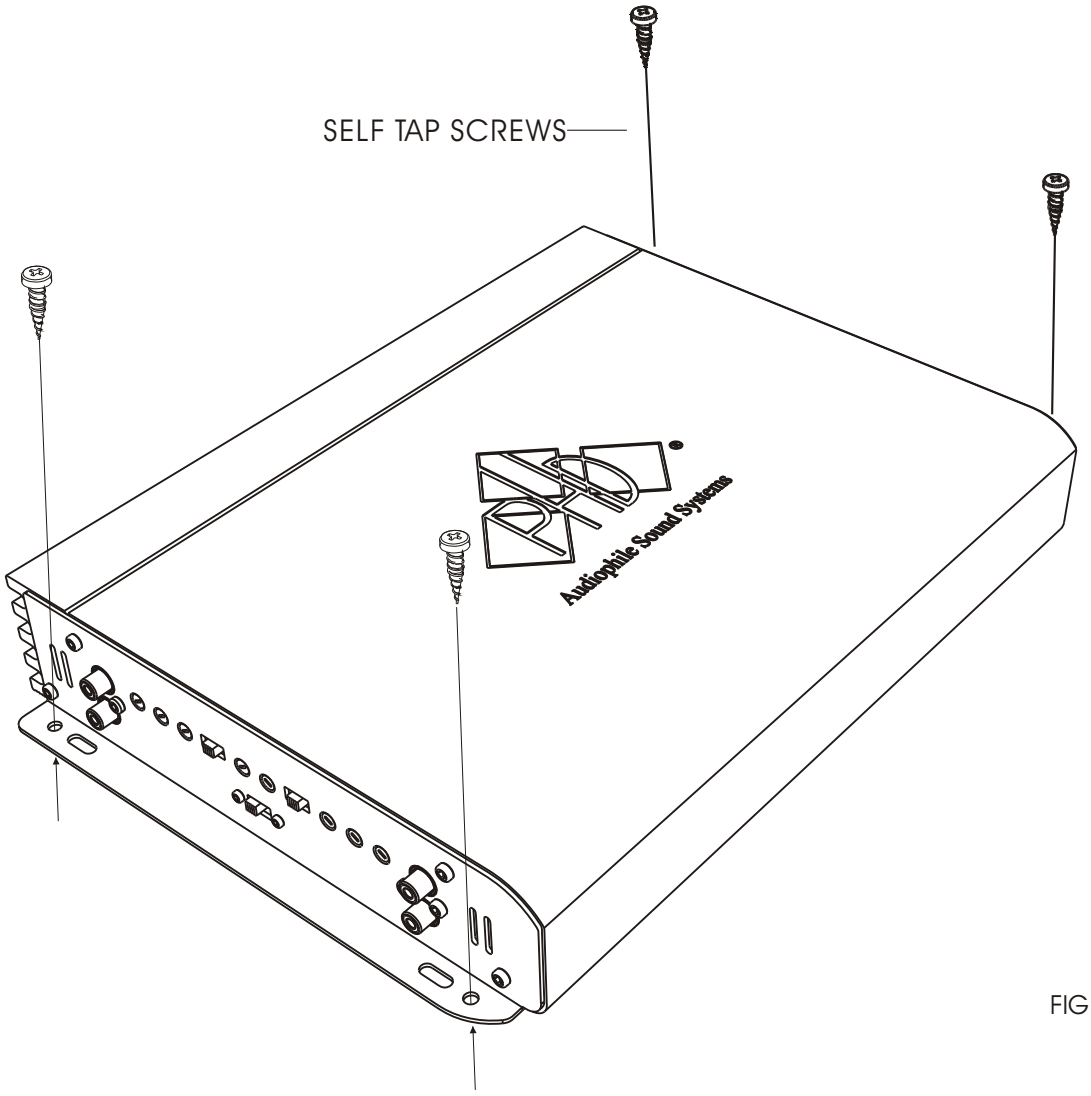


FIG.1

CONNECTIONS

INPUT CONNECTIONS

This amplifier will accept low level inputs only. Low level is the same as line level. The low level signal is carried through RCA cables. It is preferred to use low level inputs to the amplifier if the head unit is equipped with the low level outputs. If not, you can use a "high to low converter" available through your local car audio shop.

Connect the low level/line level RCA cables from the head unit, or signal processor, to the line level input on the amplifier. See Fig.2 system wiring diagrams.

POWER CONNECTIONS

It is important to have good quality power and ground connections. Remember, to complete an electrical circuit, the ground connection is just as important as the positive power connection. Before any power connections are made, disconnect the ground cable at the battery.

When the power supply lead, memory backup lead or ground lead are extended use a 5mm (AWG5) or larger automotive grade cable which will withstand friction and heat to safe grade against fires occurring as a result of short-circuiting.

GND = Connect the proper gauge ground wire to the amplifier "GND" terminal. Locate the position on the chassis of the car to which the amplifier is to be grounded. The surface must be free from any paint or dirt. This can be accomplished with a small grinding bit, sand paper or wire wheel. NOTE: Do not ground the amplifier to the "frame of the car. The frame on most cars and trucks is not grounded to the chassis(body). Use Solder or a clamp ring to connect the ground wire. Pre-drill the prepped chassis to bolt the ground ring terminal with nut, bolt and lock washers. Insulate metal and connector with paint or silicon to prevent rust and oxidation. Silicon also works great to prevent nuts and bolts from working loose in a harsh environment of an automobile. Upon completion of the ground connection, grab wire or connector and confirm that it is a solid connection. To prevent engine noise, it is recommended to ground the head unit and other audio electronics in the same location.

REM = Connect the remote wire (power antenna output) from the head unit to the remote turn-on wire of the amplifier. If the head unit is not equipped with a remote/antenna output, locate a wire that is controlled by the accessory position of the key. It is important to have the amplifier turn off with the radio or key. If the amplifier remains on, the result will most likely be a dead battery.

12V = Connect the proper gauge power wire to the amplifier "B+" terminal. Run wire to wards the fuse holder that is no greater then 0.5 meters from the battery. Remember, the fuse is to protect the safety of the car in the case of a short. Connect fuse holder to battery, but do not install fuse at this time.

2CHANNEL SYSTEM WIRING DIAGRAM (PHD2050, PHD2200)

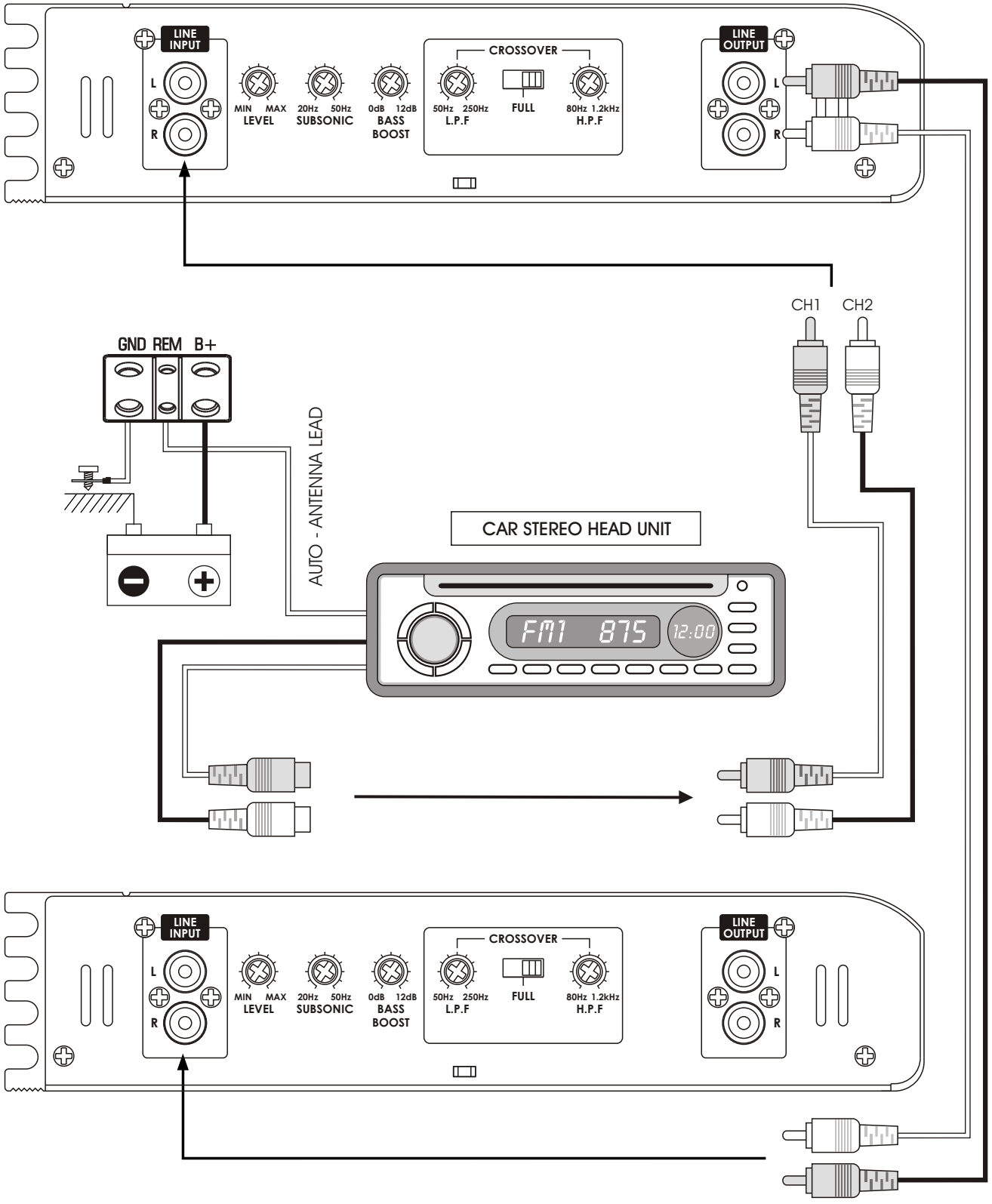
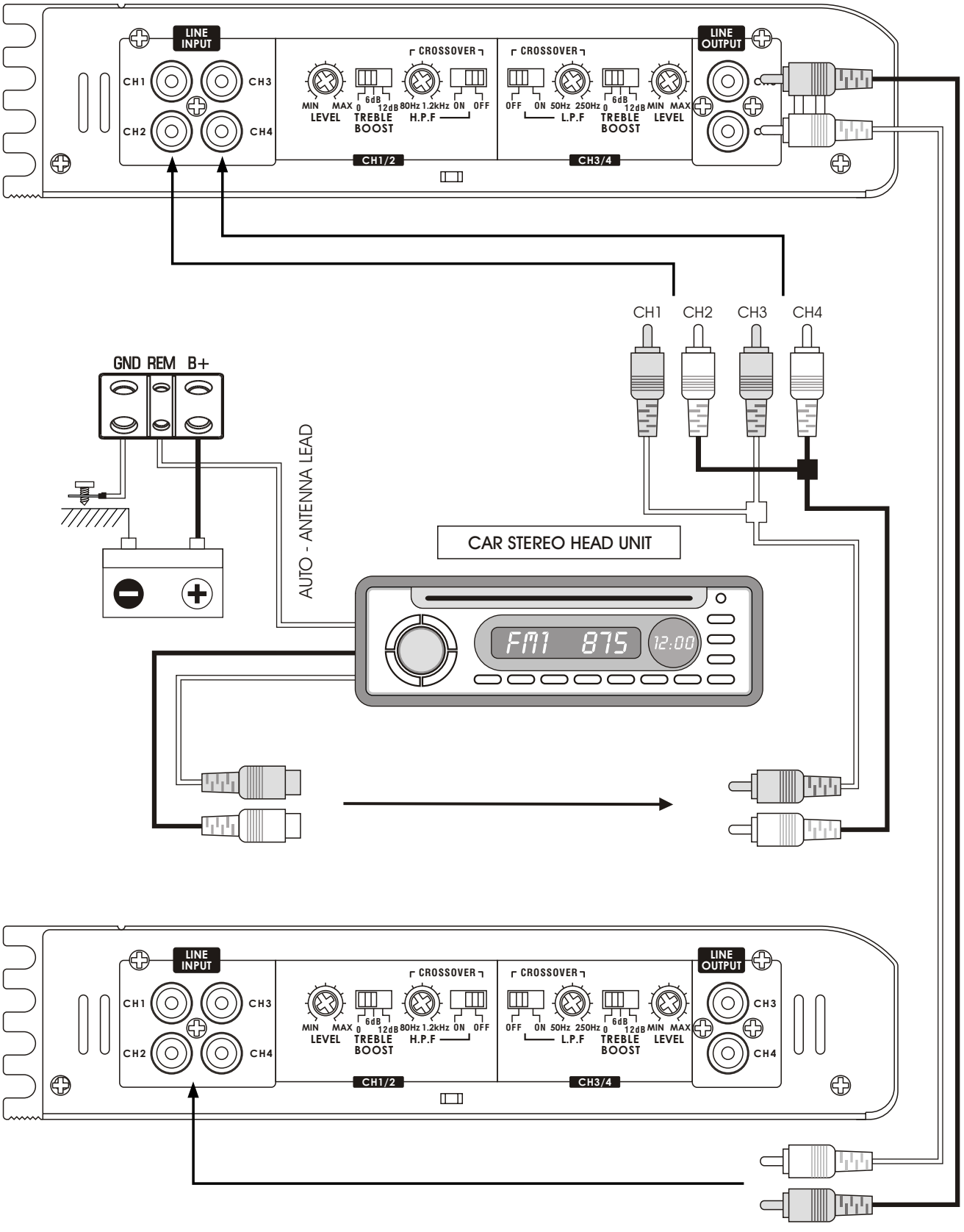


FIG.2

4CHANNEL SYSTEM WIRING DIAGRAM (PHD4050)



4CHANNEL SYSTEM WIRING DIAGRAM (PHD4075)

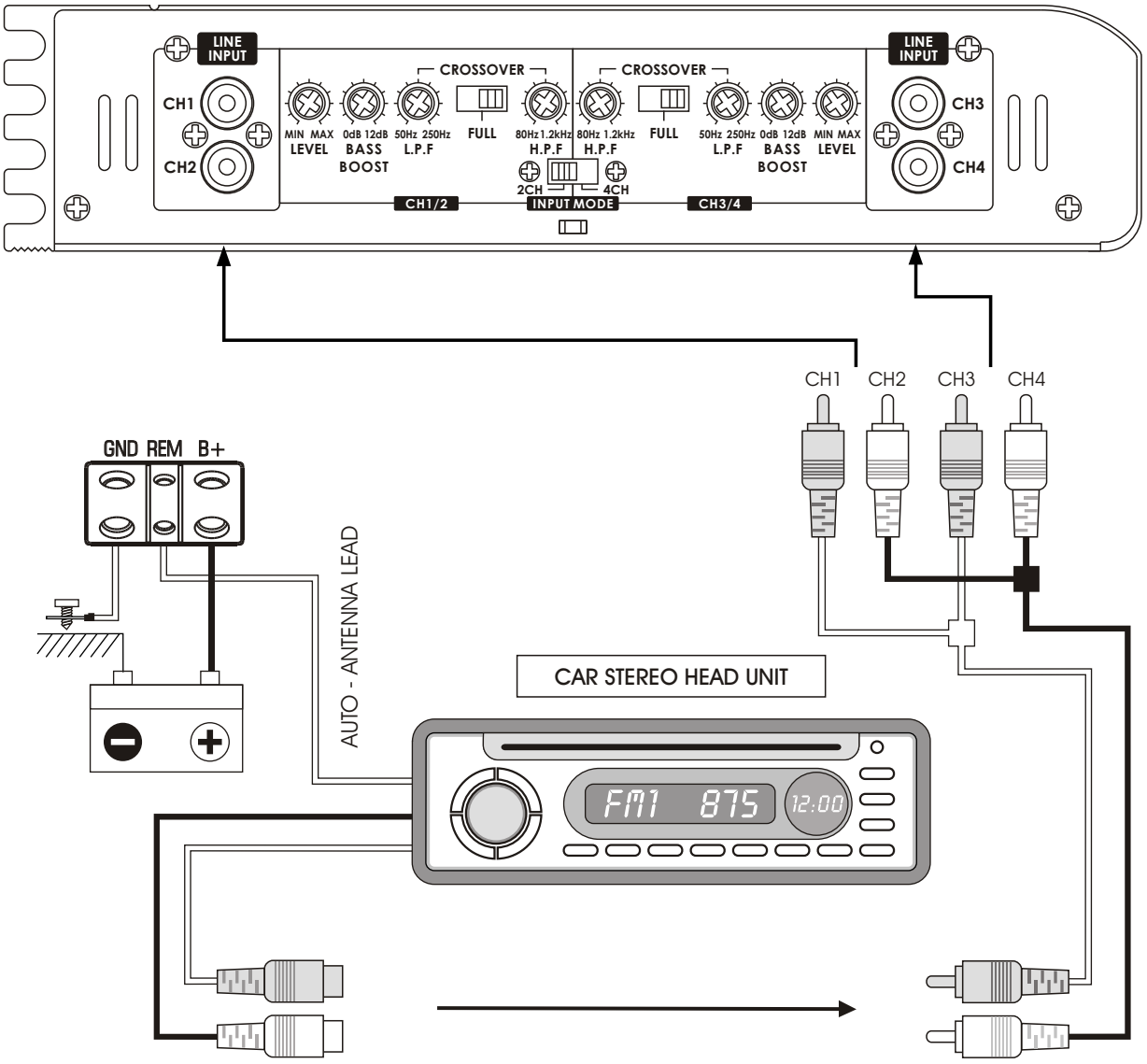
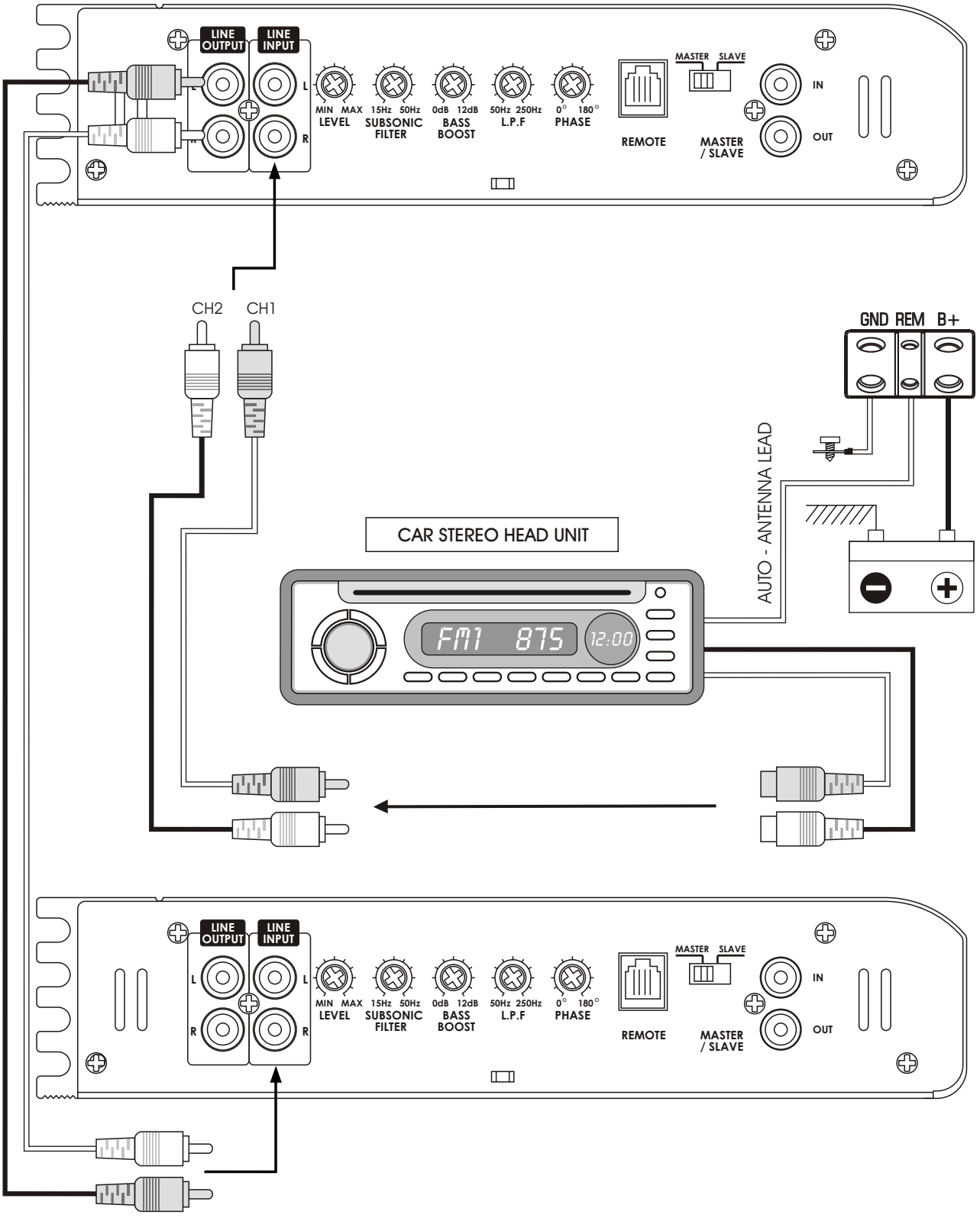


FIG.2

1CHANNEL SYSTEM WIRING DIAGRAM (PHD11000)

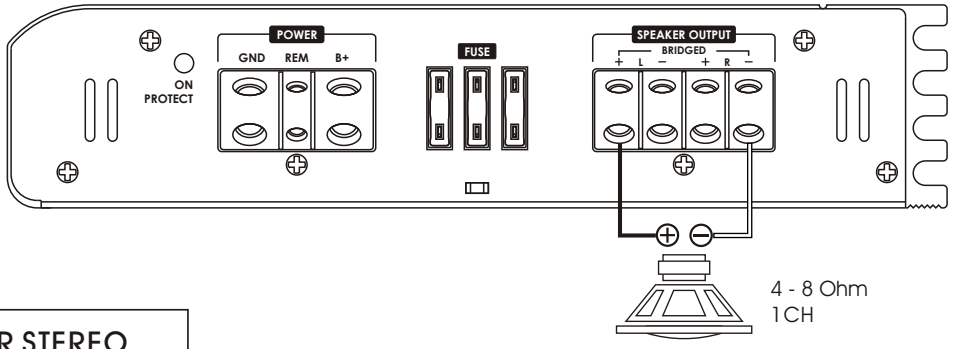


SPEAKER CONNECTIONS

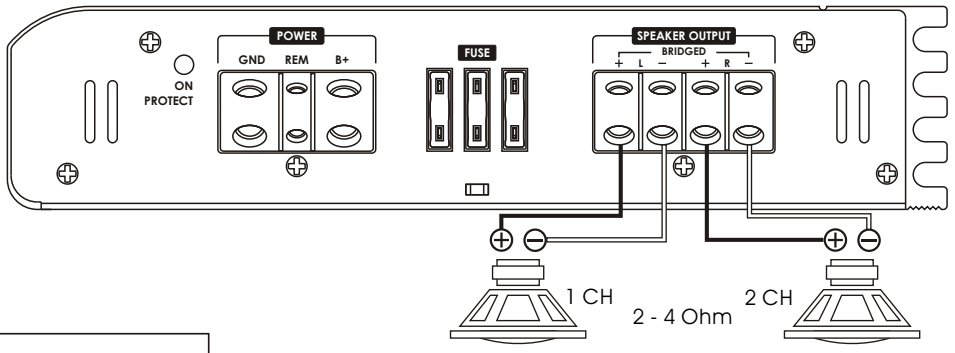
This amplifier can operate in one, two or three channel mode. The minimum impedance for single channel (bridged/mono) operation is 4 or 8 ohms. Tri channel power is referred to stereo and mono at the same time. Minimum impedance remains the same for three channel (front /subwoofer) systems as long as proper passive crossovers are used. Connect right and left speaker wire to corresponding speaker output terminals of the amplifier. Be sure to have the positive wire from the speaker connected to the positive speaker terminal of the amplifier and the negative wire from the speaker must connect with the negative speaker terminal of the amplifier. Reversing any of these connections will result in the speaker cones moving out of phase which causes bass cancellation. See Fig.3 Speaker Output Connections.

2 CHANNEL SPEAKER WIRING DIAGRAM (PHD 2050, PHD 2200)

1 SPEAKER BRIDGED



2 SPEAKER STEREO



3 SPEAKER TRI MODE

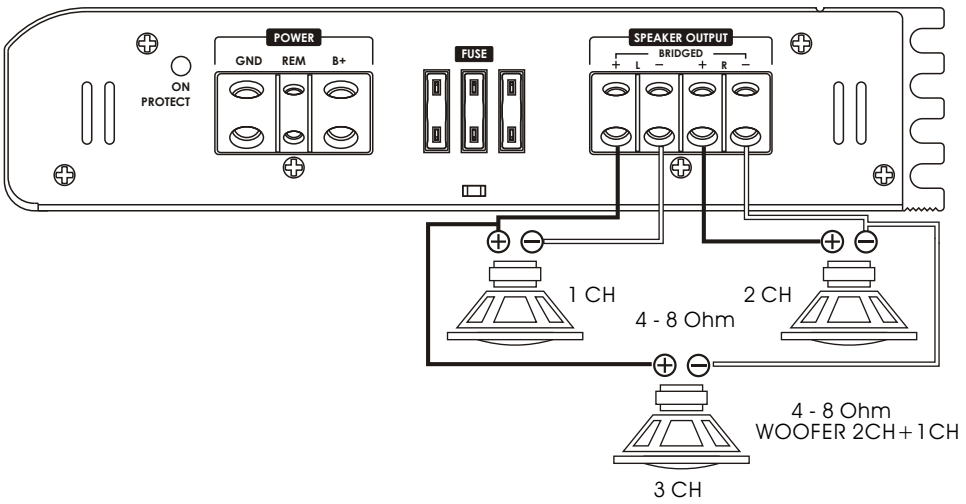
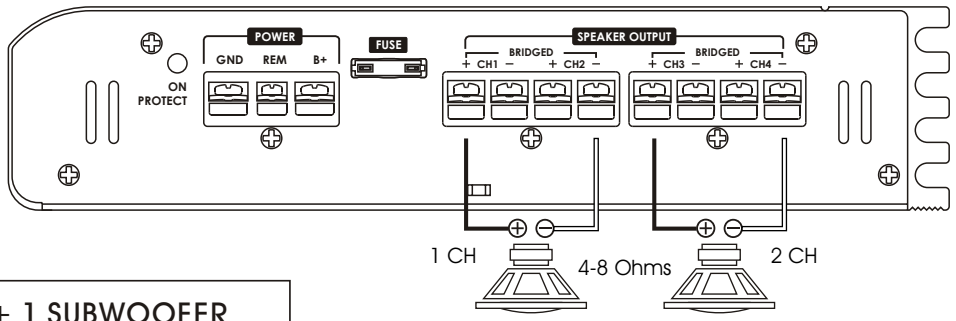


FIG.3

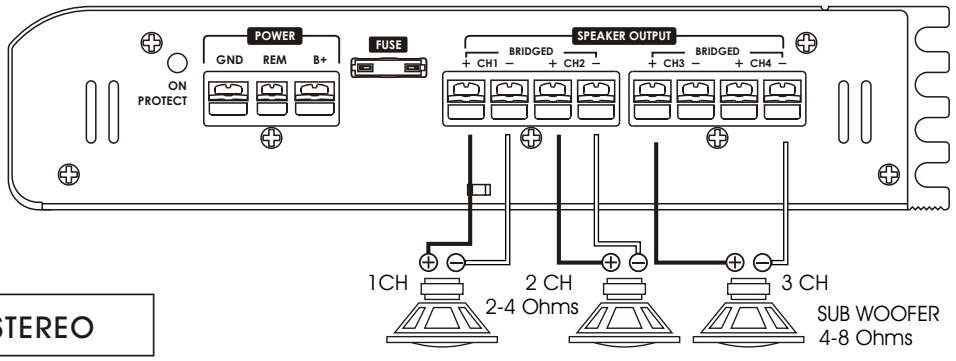
SPEAKER CONNECTIONS

4 CHANNEL SPEAKER WIRING DIAGRAM (PHD 4050)

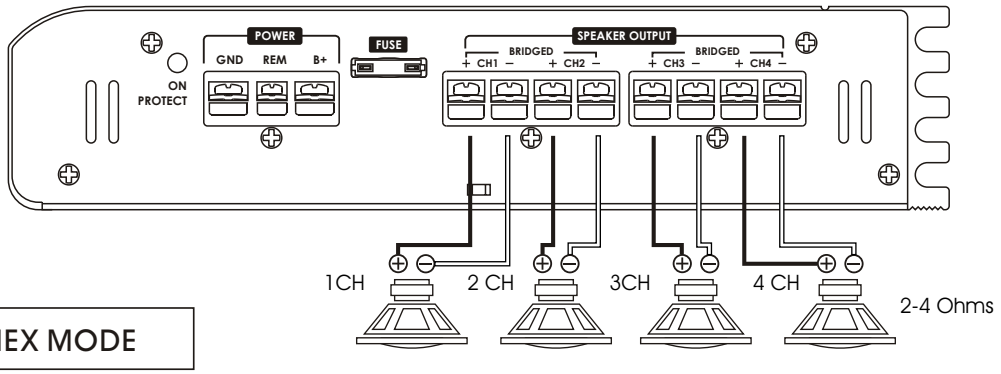
2 SPEAKER BRIDGED



2 SPEAKER + 1 SUBWOOFER



4 SPEAKER STEREO



6 SPEAKER HEX MODE

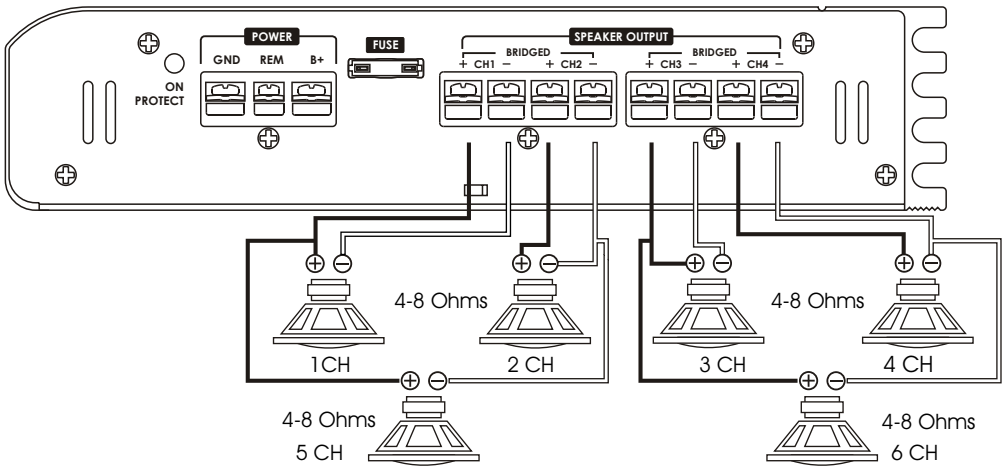
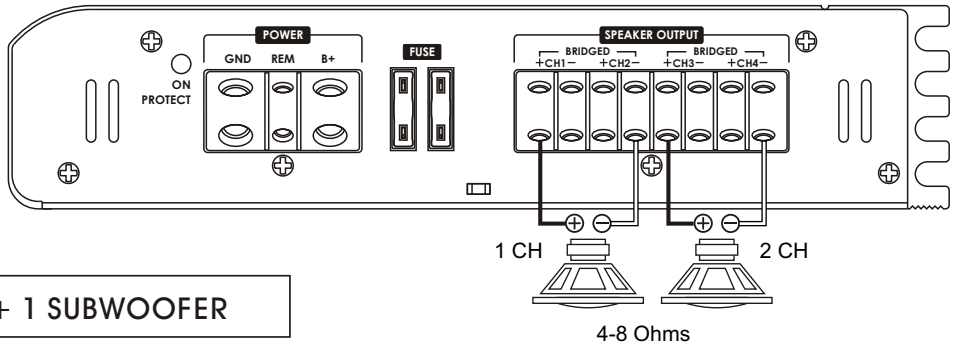


FIG.3

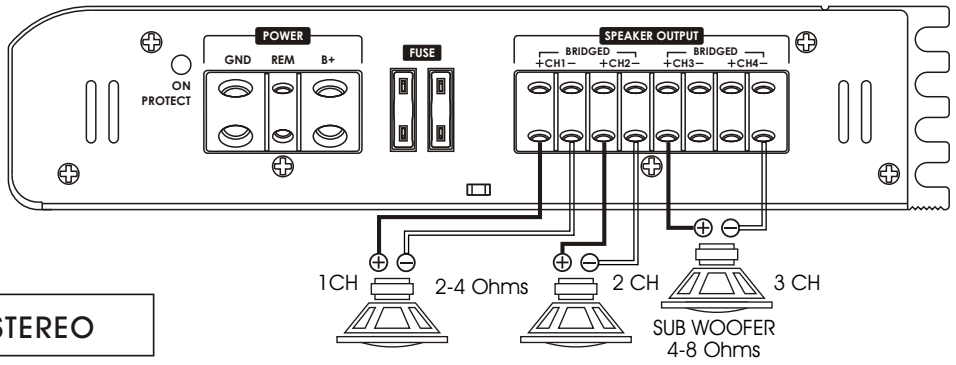
SPEAKER CONNECTIONS

4 CHANNEL SPEAKER WIRING DIAGRAM (PHD 4075)

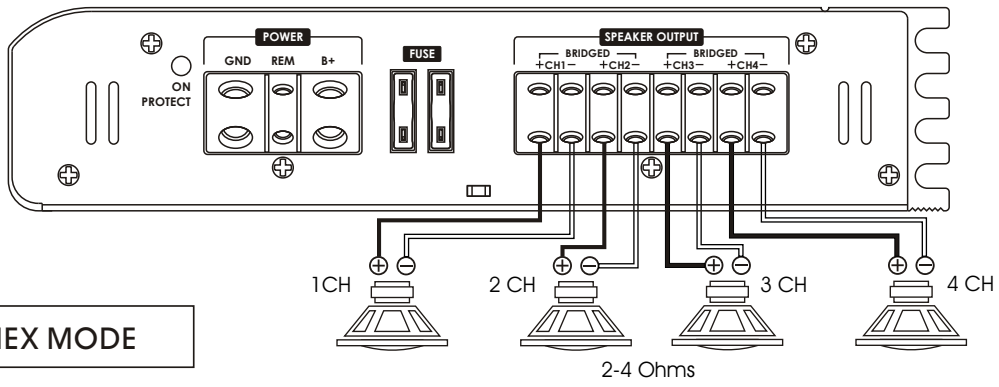
2 SPEAKER BRIDGED



2 SPEAKER + 1 SUBWOOFER



4 SPEAKER STEREO



6 SPEAKER HEX MODE

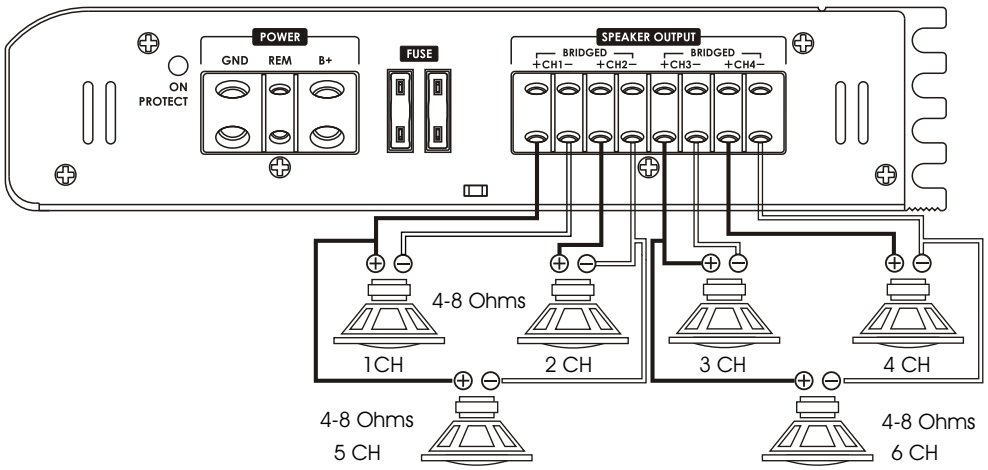
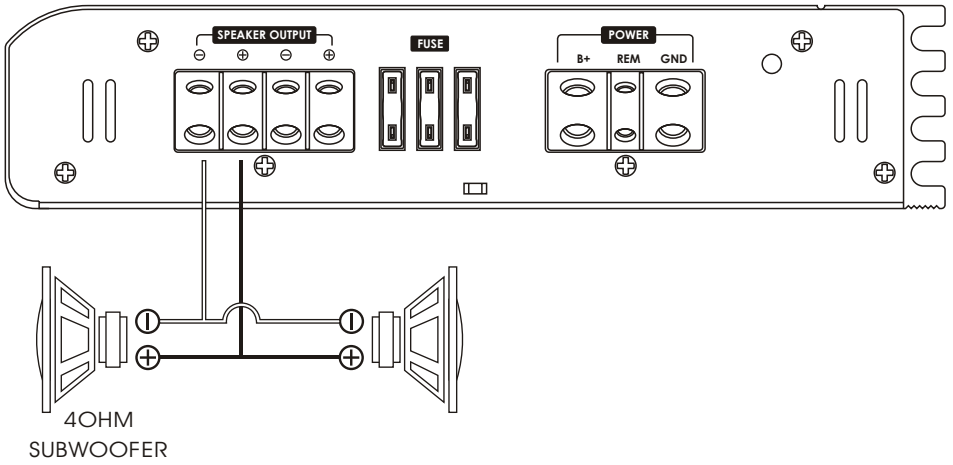


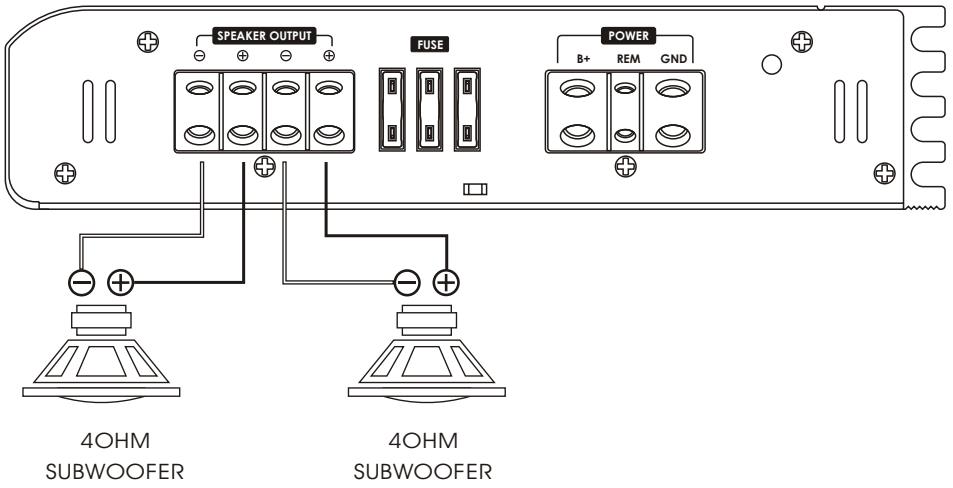
FIG.3

SPEAKER CONNECTIONS

1 CHANNEL SPEAKER WIRING DIAGRAM (PHD 11000)

The Class "D" amplifier is a SINGLE CHANNEL dedicated subwoofer amplifier. Unlike other amplifiers, the Class "D" operates as a single channel and cannot be bridged. Don't be fooled by the outputs. Two outputs are used strictly for convenience and are paralleled internally on the amplifier. This means that if both outputs are used with one driver each, the amplifier sees the same load as if the same drivers are connected to Only one output terminal. See diagram below.





In both diagrams, the amplifier sees a 2 ohm load.

FIG.3

SPEAKER CONNECTIONS

WIRING SUBWOOFERS (DUAL AMPS)

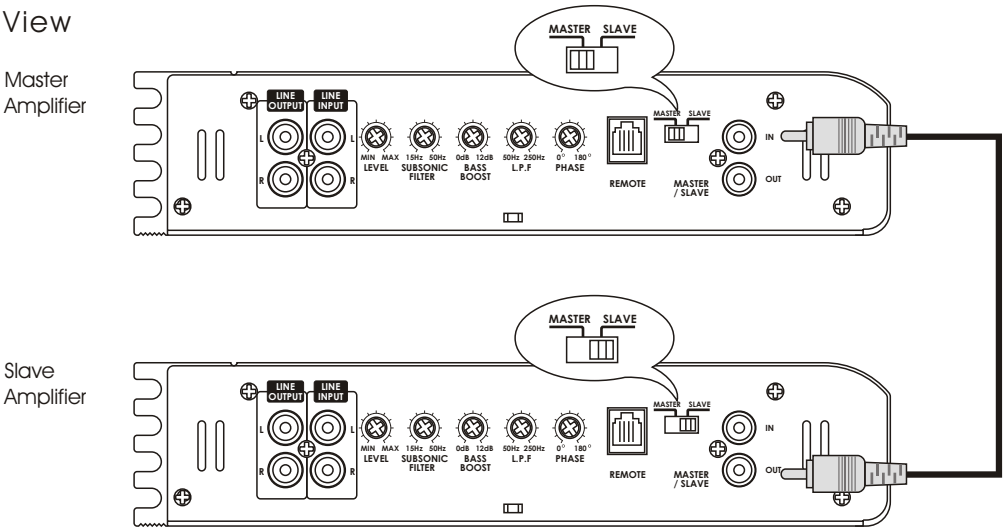
When using dual amplifiers to power one subwoofer, the Positive terminal of the Subwoofers voice coil is connected the positive terminal of the MASTER Amplifier and the Negative terminal of the Subwoofers voice coil is connected to Positive terminal on the SLAVE Amplifier. This procedure will allow the total power of both amplifiers to be added together and act like a single powerful amplifier. Please check that your subwoofer power handling capabilities are not exceeded when hooking two amplifiers to it.

CAUTION

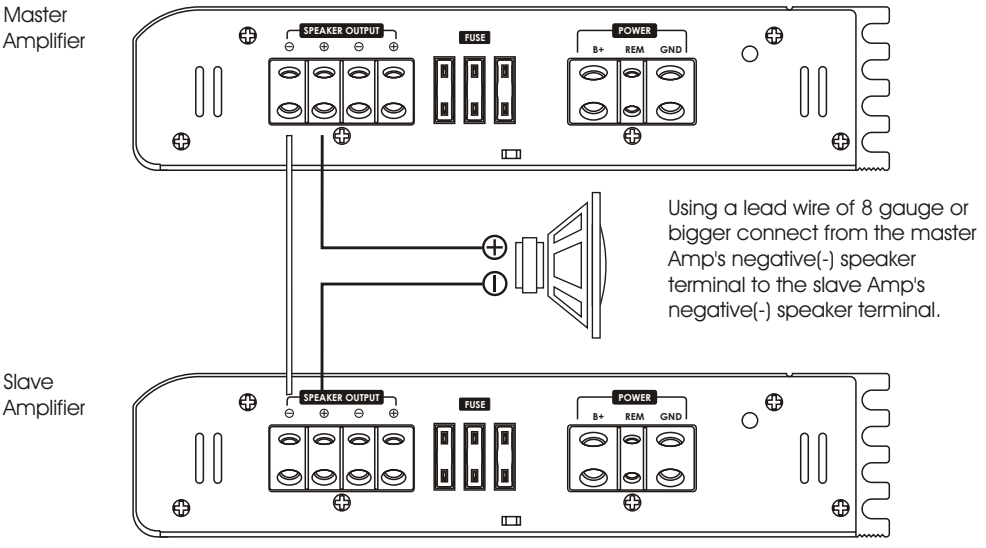
Always check your speaker load with a multi-meter before hooking up to the amplifier. These digital amplifiers are only 1 ohm stable. Any Impedance (load) smaller than 1 ohm will damage the amplifier. Such Damage is not covered under warranty either, so pay strict attention to what connections are made to the amplifier.

MONO BRIDGED

Front View



Rear View


Master Amplifier
Slave Amplifier
SPEAKER OUTPUT
FUSE
POWER
B+ REM GND
Using a lead wire of 8 gauge or bigger connect from the master Amp's negative(-) speaker terminal to the slave Amp's negative(-) speaker terminal.

ADJUSTMENTS

1.Set to the "H.P.F" position when the amplifier is used to drive a tweeter/midrange system. The frequencies below the crossover point will be attenuated at 12dB/octave. Permits adjustment of the crossover frequency ,by rotating the knob to select any frequency between 80Hz to 1.2kHz as the crossover point.

2.Set to the "L.P.F" position when the amplifier is used to drive a subwoofer. The frequencies above the crossover point will be attenuated at 12dB /octave. Permits adjustment of the crossover frequency, by rotating the knob to select any frequency between 50Hz to 250Hz as the crossover point.

3.Set to the "OFF" position when the amplifier will be used for driving full-range speakers. The full frequency band width (20Hz - 20kHz) will be output to the speakers without high or low frequency attenuation.

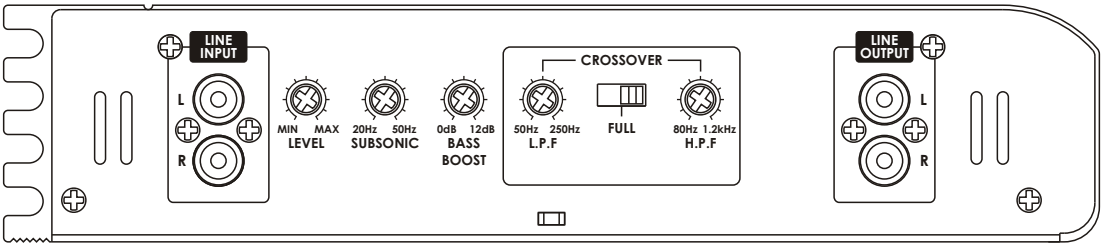
4.Level adjustment-The sensitivity adjustment is to allow the amplifier to work with many different brands of head units. It allows input signal to vary between 200 millivolts to 6 volt from the head unit or other signal processor. Start by setting the sensitivity adjustment to the "MIN" (6 volts).Using a cassette or compact disc that you are familiar with ,turn on head unit to the 3/4 volume setting. Slowly turn up sensitivity adjustment towards the "MAX" (200 millivolts) using a flat head screw driver. Stop turning on the onset of distortion and turn back just a slight. The 3/4 volume setting is now the "maximum" volume for the head unit. The goal is to keep the level control to the lowest setting yet still have enough signal to drive the amplifier. This is done to prevent over driving the amplifier and to keep system noise to a minimum. It is important not over drive speakers (at point of distortion) this will cause permanent damage to the speakers. Also, if the amplifier itself is over driven, it could be damaged.

5.The "BASS" function can be selected to increase low frequency response output, or decrease frequency response output. The "BASS" function will be working at only "OFF" or "L.P.F" position.

The BASS is adjustable from 0 ~ 12dB boost at 50Hz.

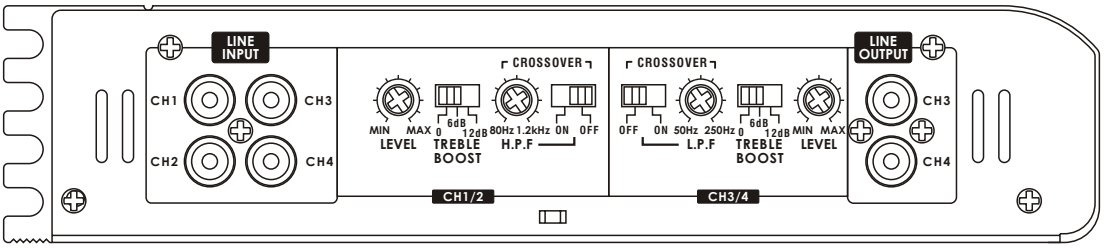
FRONT PANEL

PHD2050, PHD2200

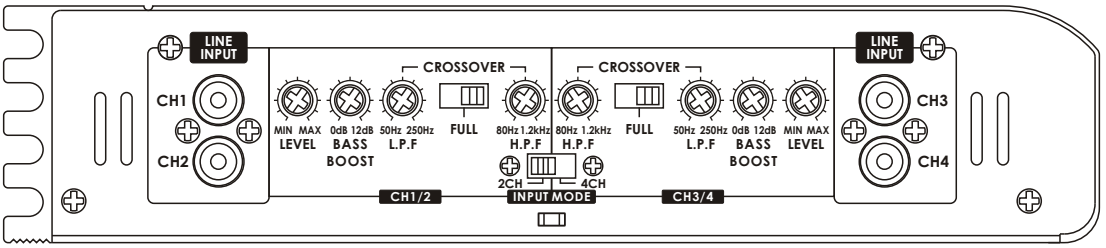


FRONT PANEL

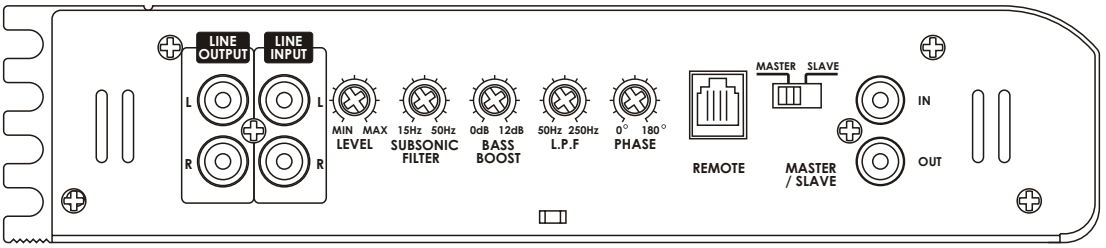
PHD4050



PHD4075



PHD11000



TROUBLE SHOOTING GUIDE.

This section provides you with a catalog of amplifier symptoms and their probable causes and solutions. Before you consult this listing, make sure the vehicle's electrical system is working properly by verifying that other electrical items (e. g. headlights, windows, etc.) Still function correctly.

SYMPTOM	PROBABLE CAUSE	SOLUTION
No Audio	Low or N.C Remote Turn-on connections	Check remote turn-on voltage at amp and head unit
	Blown Fuse Power wires not connected	Replace with new fast-blow fuse Check butt splices or solder joints Check ground and battery connections
	Blown or non speakers connected	Use VOM or DVM to measure speaker coil impedance; check speaker wiring connections
Distorted Audio	Input Sensitivity not set properly or damaged speaker cones	See adjustment procedure and check each step; Inspect each speaker for damage and repair or replace suspected component
	Low turn-on voltage	Refer to head unit owner's manual
Audio Level Low	Mute circuit on head unit is on.	Check electrical system for low voltage; Check ground connection
Audio Lacks	Speakers wired with wrong polarity, causing cancellation of bass frequencies	Check polarity of wires from amplifiers to each speaker as defined by the system design Check battery voltage at amplifier during operation
External Fuse Blowing	Incorrect wiring or short circuit	Refer to electrical installation and check each installation step
Whining noise on audio with engine running	Amplifier is picking up alternator noise	Install an in-line noise filter on the head unit's power wire; Check alternator routing diodes or voltage regulator for proper operation. Check all grounds , battery voltage, and RCA cables
Ticking noise on audio with engine running	Amplifier is picking up radiated spark noise	Check RCA audio cable; Install an in-line noise filter on the head unit's power wire. Check spark plug wires.

Audiophile Sound Systems